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ABSTRACT

Common questions that children ask can promote creative thinking. The question, "What will happen if...?" can set the stage for creative problem solving by encouraging the use of the scientific method. The scientific method involves learning how to hypothesize, recording procedures for experimentation, developing skills in observation and data collection, interpreting results, and drawing conclusions. A simple experiment using raisins, clear soda pop, and a large glass can stimulate the right questions and encourage creative solutions by students. Labeling each step of the process and recording what occurs guides students in a logical manner. Guiding students through the scientific method thus promotes creative thinking both inside and outside of the classroom and helps students better understand the world around them. (BJD)

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Creative Thinking Through Science

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Creative Thinking Through Science

Part of what we hope young children will gain from science activities is a better understanding of the world around them. However, somewhere between all the experiments and observation, an equally important goal is sometimes forgotton: learning how to think in a creative, yet logical, manner. This skill not only benefits the child in current efforts to explore and learn about the environment, but lays the foundation for later, more sophisticated scientific thought.

Opportunities to use the scientific method of inquiry can be planned by the teacher, or may occur spontaneously through children's questions. As soon as someone asks, "What will happen if...?" the stage is set for creative problem solving.

The scientific method involves learning how to hypothesize, recording procedures for experimentation, developing skills in observation and data collection, interpreting results and drawing conclusions. Each section develops a different type of skill for the child. By asking the right questions and encouraging and accepting creative solutions, you've allowed children to think through their own problems and develop alternative solutions. Labeling each step of the process and recording what occurs guides the child in a logical manner.

STATING THE PROBLEM

One morning I placed a box of raisins and a bottle of clear soda pop and a large glass jug on a table in front of the classroom. It wasn't too long before someone asked, "What are the raisins for? Are we having a snack today?"

"They're not for a snack," I said, "I was thinking about doing an experiment with them today." I wrote on the blackboard: Stating the Problem. "We have a problem to solve," I continued, "I want to know what will happen if I put raisins into soda pop." I printed the problem on the board under this first heading.

HYPOTHESES

"What do you think will happen if I drop the raisins in the soda pop?" The hands shot up around the classroom.

"They'll sink!"

"They'll float!"

"They'll dissolve!"

"They'll turn white and pop!"

I wrote the word Hypotheses on the board. "Hypotheses is another word for guesses. Each of your ideas was a hypothesis." I recalled the children and had each write their hypothesis on the blackboard.

"When we do an experiment, we try to think of all the possible answers to our problem before we do the experiment. Now that we've written down all the hypotheses that we can imagine, we're almost ready to do the experiment.

EXPERIMENT

"Before testing the hypotheses we need to write down what we will do and everything we will need to conduct our experiment. This is called the Methods section. The first part of the methods section is called Materials." I printed the word on the blackboard and called on a child to be the recorder.

"What materials do we have to have to solve the problem?" I asked.

"We need raisins and soda pop, called out one child. The recorder printed this on the blackboard.

"Anything else you can think of that we might need?" I prodded.

There was silence for awhile, then one hand waved frantically. "If we drop the raisins in the pop we won't be able to see them because the bottle is dark and green. We need that clear jug!"

"Good idea," I answered. "This will be much easier to see through."

"Next we need to write down how we will do the experiment. This part of the methods section is called Procedures."

One child raised her hand, "First open the pop and pour it into the clear jug. Then put the raisins in the pop." I printed the word Procedures on the board and the recorder printed the directions under the heading.

"Now we're ready to do the experiment," I explained. "We have everything we need and we know exactly what to do. When we put the raisins in the soda pop, look very carefully and tell me what you see. This will be the Data and Results section and I'll write down your observations."

DATA AND RESULTS

"They're dancing!"

"They go up and down, up and down."

"Some raisins sit on the bottom."

"I see bubbles, they pop on top."

"The raisins are covered with bubbles."

I printed each of their observations on the board, the raisins continued to bob up and down. "Now we're almost finished," I said. "Let's look back at our hypotheses and see if any of our guesses were right."

CONCLUSIONS

The children looked at their list, a few hands popped up. "We sort of guessed right. We thought they would sink, and they did sink. But they floated too."

"Let's figure out the answer to my problem," I continued. "What happens if raisins are put in soda pop?" I wrote the word Conclusions on the blackboard. We eventually figured out that the raisins collected bubbles at the bottom of the jar, the bubbles carried the raisins to the surface where they burst. Without the bubbles, the raisins sank to the bottom where they collected more bubbles and rose to the surface again.

The kids seemed impressed with the experiment, but I wondered whether they would use the scientific method outside the classroom. I dismissed them for

lunch and was reassured when I overheard one of the children ask a friend, "I wonder what would happen if you put raisins in milk?"

"I bet they'd sink. I've got raisins for lunch, do you want to do an experiment?" the friend replied.

Since that first attempt at using the scientific method, I have integrated it into every science project we do at school. The children have developed a sense of security with asking questions and seeking answers. Their thoughts are creative, their questions have become more sophisticated, and they are developing skills that make problem solving more efficient. I've found that scientific thinking is much easier than I ever believed possible. Consider using the scientific method of inquiry next time you hear, "Teacher, what will happen if...?"